Ichthyology Encyclopedia Article

Ichthyology

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Ichthyology

Ichthyology is the scientific study of the multiplicity of aquatic chordates known as fish. It has been noted that fishes of various classes differ among themselves as much as, or more than, other chordate classes (amphibians, reptiles, birds, and mammals) differ between each other. Jawless fish, the Class Agnatha, are parasitic and include the lampreys and hagfishes. They are bereft of jaws and paired fins. Sharks, rays, and skates are fish with a cartilaginous skeleton and belong to the Class Chondrichthyes. The largest class of fishes, Class Osteichthyes, are the common fishes with bones and are well known to sportsmen and commercial fishermen and people who enjoy eating non-red meat.

The vertebrate kidney has evolved from a primitive pronephros through a mesonephros to the highly evolved kidney of humans, the metanephros. Not just humans but all mammals have a metanephric kidney. All amphibians have a mesonephric kidney. As stated above, fishes of various classes differ significantly. For instance, hagfishes retain the primitive pronephros; most bony fish develop a mesonephros.

Fish are harvested for commercial purposes. Thus, many millions of fish are taken each year for human consumption. It should not be surprising therefore to learn that many kinds of malignancies have been observed in these animals. The Registry of Tumors of Lower Animals, located at George Washington University, reported that in its collection, almost three-fourths of the tumors of chordates were of tumors of fish. Most of the fish tumors were of bony fish. This knowledge gleaned from examining fish helps in the evaluation of pollution of our fresh water and oceans. A reduced prevalence of fish tumors at a particular location suggests the efficacy of clean-up efforts; an increased incidence is a warning flag concerning environmental deterioration.

Fishes are vulnerable to infections by viruses as are higher vertebrates. A herpesvirus of the channel catfish has been isolated and its viral DNA has been characterized in detail. Other fish herpesviruses have been studied and they are thought to cause cancer in carp and salmon. Virus study in fish may lead to enhanced understanding how viruses cause disease in fish and in higher organisms.